

SOLIDWORKS® SIMULATION DESKTOP PRODUCT MATRIX

KEY CAPABILITIES	SOLIDWORKS Simulation Standard	SOLIDWORKS Simulation Professional	SOLIDWORKS Simulation Premium
FULLY INTEGRATED IN SOLIDWORKS DESIGN			
Run simulations without leaving your CAD environment	●	●	●
Start designing with no relearning with the familiar SOLIDWORKS interface – toolbars, menus, and right-click context menus	●	●	●
Update design changes automatically with models that stay associative	●	●	●
Carry over SOLIDWORKS materials and configurations directly – results overlay on your geometry in context	●	●	●
FEA MODELING			
Analyze parts and assemblies using solid, shell, and beam element formulations	●	●	●
STANDARD INTERACTIONS AND CONNECTORS			
Join components using bonded interactions with common nodes or an independent mesh with node-to-surface and surface-to-surface formulations	●	●	●
Define contact interactions, Shrink Fit, and Virtual Wall conditions with node-to-surface and surface-to-surface formulations	●	●	●
Simplify assemblies with free interaction	●	●	●
Choose from a range of connectors: Bolt, Spring, Pin, Elastic Support, Bearing, Edge Weld, Spot Weld, Link, Rigid Connection	●	●	●
Run a connector safety check	●	●	●
LOADS AND CONSTRAINTS			
Prescribe degrees of freedom with fixtures	●	●	●
Apply force, pressure, and remote structural loads	●	●	●
Apply temperature loading	●	●	●
Import pressure and thermal loads from SOLIDWORKS Flow Simulation	●	●	●

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DIAGNOSTIC TOOLS			
Discover Simulation Evaluator, Interaction Viewer, Mesh Failure Diagnostics, Mesh Quality Diagnostics, Convergence Diagnostic Plot, Stress Hot Spot Diagnostics	●	●	●
Detect underconstrained bodies	●	●	●
COMMUNICATION WITH REPORTS AND eDRAWINGS®			
Customize simulation reports	●	●	●
View eDrawings of simulation results	●	●	●
LINEAR STATIC SIMULATION			
Analyze stress, strain, displacement, and factor of safety (FOS) across parts and assemblies	●	●	●
Apply static loads, linear elastic materials, and small displacements	●	●	●
TIME-BASED MOTION			
Calculate velocities, accelerations, and movements of rigid body assemblies under operational loads	●	●	●
Once motion analysis is complete, transfer the resulting component body and connection loads directly into linear analysis for a complete structural investigation	●	●	●
DESIGN COMPARISON STUDIES			
Evaluate "what if" scenarios across design variables including dimensions, mass properties, and simulation parameters, to compare performance outcomes	●	●	●
FATIGUE SIMULATION			
Estimate high-cycle fatigue life for components under varying loads with stresses below material yield strength	●	●	●
Predict failure locations and cycles to failure across multiple load events using cumulative damage theory	●	●	●
TREND TRACKER			
Track how stress, displacement, or FOS results change across static study iterations to identify design trends and performance direction	●	●	●
MESHING			
Control mesh density and accuracy with three mesher types: standard, curvature-based, and blended curvature-based	●	●	●
DESIGN OPTIMIZATION			
Find the optimum design configuration based on user-defined goals (minimize mass, stress, or deflection) using design of experiments (DoE) methodology		●	●
Design variables include CAD dimensions, material properties, and load values		●	●

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LOAD CASE MANAGER

Evaluate multiple load combinations in a single study to compare structural response across the scenario



ADVANCED INTERACTIONS AND CONNECTORS

Automatically convert Toolbox fasteners from SOLIDWORKS Design models to Simulation bolt connectors



Model thermal contact resistance between surfaces to account for imperfect thermal coupling at interfaces



Apply an insulated condition to prevent heat transfer across selected boundaries



Model flexible and rigid connections between non-coincident locations with additional connector types: Linkage Rod, General Spring, and Cable



TOPOLOGY OPTIMIZATION STUDIES

Discover new minimal material design alternatives under linear elastic static loading while still meeting component stress, stiffness, and vibrational requirements



EVENT-BASED MOTION SIMULATION

Generate motion analysis by event-triggered motion control using any combination of sensors, events, or schedules



FREQUENCY SIMULATION

Find your product's natural frequencies and mode shapes before vibration in the field becomes a problem



BUCKLING (COLLAPSE) SIMULATION

Predict the buckling load factor for slender components – the critical load at which collapse occurs before material yield



THERMAL SIMULATION

Analyze steady-state and transient heat transfer to map temperature, gradients, and heat flux – then feed results directly into static stress studies



DROP TEST SIMULATION

Predict how a part or assembly responds to impact when dropped onto a target surface



PRESSURE VESSEL DESIGN

Calculate linearized stress to verify safe design to pressure vessel standards



SUBMODELING SIMULATION

Analyze a critical region of a large assembly in detail – without running the full model at high resolution



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2D SIMPLIFICATION

Cut solve time significantly by reducing eligible 3D models to 2D plane stress, plane strain, or axisymmetric representations



ADVANCED MESHING

Generate higher-quality meshes on complex geometry faster with a blended curvature-based mesher and multithreading support



LINEAR DYNAMIC SIMULATION

Analyze the structural response to dynamic loads – including forced vibration, impact, and shock – across four study types: Modal Time History, Harmonic, Random Vibration, and Response Spectrum



NONLINEAR SIMULATION

Analyze complex material behavior – post-yield metals, rubbers, and plastics – including large deflections and sliding contact



Activate and release fixtures using force, displacement, or arc length control



Calculate permanent deformation and residual stresses from excessive loads, predict component performance for springs and clip fasteners, and solve impact problems alongside nonlinear static problems



Account for the effect of real-time varying loads, solving impact problems in addition to nonlinear static problems



COMPOSITES SIMULATION

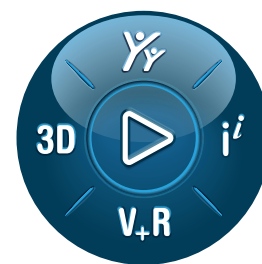
Analyze the structural response of multi-material composite components under load



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for Real Life**

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